

SECTION 09440

RESINOUS MATRIX TERRAZZO FLOORING

{THIN SET EPOXY TERRAZZO}

PART 1 GENERAL

1.1 SUMMARY

A. Section includes thin set epoxy terrazzo floor, divider strips, expansion joint strips.

B. Related Sections:

1. Section 02225 Minor Demolition for Remodeling

1.2 REFERENCES

A. National Terrazzo and Mosaic Association:

1. NTMA - Terrazzo Specifications Guide.

1.3 PRIMARY SUBMITTALS

A. Shop Drawings:

1. Divider strip layout.
2. Control joint layout.
3. Flooring material transitions..

B. Product Data:

1. Epoxy terrazzo flooring:
 - a) Physical Properties.
 - b) Performance Properties.
 - c) Specified Tests.
 - d) Material Safety Data.
 - e) Manufacturer's Warranty
2. Divider strips.
3. Control joint strip.
4. Joint Sealer.
5. Floor Sealer.

C. Samples:

1. Samples for color and aggregate blending selection: Submit manufacturer's color plates showing the full arrange of colors and patterns available.
2. Sample for verification: Submit two 12"x12" samples matching architect's selection in color, chip size and variation, chip gradation, matrix color and typical divider strip.

D. Miscellaneous Submittals: See paragraphs 1.4 – Sustainable Design Submittals, 1.5 – Closeout Submittals, 1.6 – Qualify Assurance and 1.7 – Qualifications.

1.4 SUSTAINABLE DESIGN SUBMITTALS

A. Materials Resources information:

1. Data on recycled material content, including types and percentage.
2. Data on local and regional products, including types, percentage and distance from project site.

1.5 CLOSEOUT SUBMITTALS

- A. Submit documents and materials required by Section 01700, Execution Requirements, - closeout procedures.
- B. Operation and Maintenance Data: Submit documents of procedures for stain removal, stripping, and sealing.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with NTMA recommendations contained in "Terrazzo Information Guide"
- B. Maintain one (1) copy of each required quality assurance practice document on site.
- C. Source Limitations:
 - 1. Obtain primary Epoxy Terrazzo Flooring System materials, including membranes, primers, resins and hardening agents from a single manufacturer.
 - 2. Obtain aggregates, divider strips, sealers, cleaners form source recommended by primary materials manufacturer.
- D. Material Test Reports: Submit reports of moisture and relative humidity tests of existing substrates to verify that conditions are suitable for installation of an epoxy terrazzo floor.

1.7 QUALIFICATIONS

- A. Manufacturer:
 - 1. Experience: Company specializing in manufacturing products specified in this section with minimum five years documented experience.
 - 2. NTMA Membership OR Associate Membership: In good standing with certificate or other verifiable proof.
 - 3. List of completed projects: Submit a list of at least five (5) projects of epoxy flooring in sizes no less than 50% each of work of this project.
- B. Installer:
 - 1. Experience: Company specializing in performing Work of this section with minimum five (5) years documented experience.
 - 2. NTMA Contractor Membership: In good standing with certificate or other verifiable proof.
 - 3. List of completed projects: Submit a list of at least five (5) projects of epoxy flooring in sizes no less than 50% each of work of this project.

1.8 MOCKUP

- A. Mockup is not required unless a multicolor floor is to be installed. In the event that this shall occur, instructions for a mockup or mockups shall be furnished by Architect.

1.9 PRE-INSTALLATION MEETING

- A. Refer to Section 01300 - Administrative Requirements: Pre-installation meeting.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Refer to Section 01600 - Product Requirements: Product storage and handling requirements.
- B. Store resin materials in dry, secure area.
- C. Maintain minimum temperature of 60 degrees F and 80 degrees F.

- D. Keep products away from fire or open flame.

1.11 ENVIRONMENTAL REQUIREMENTS AND INSTALLATION CONDITIONS

- A. Refer to Section 01600 - Product Requirements.
- B. Substrate Conditions:
 - 1. Moisture Content: Subfloor concrete slab moisture content shall conform to NTMA recommendations. Refer to Part 3 Execution of evaluation and remedies.
 - 2. Level Tolerance: Subfloor concrete slab maximum variation from level shall be 1/4" in 10 feet. Refer to Part 3 Execution of evaluation and remedies.
 - 3. Surface Profile: Subfloor concrete slab surface shall have a profile conforming to CSP3-CSp5 of ICRI Guideline NO 03732. Refer to Part 3 Execution of evaluation and remedies.
- C. Ambient room and floor temperature: Maintain a temperature of 60 degree F or above for a period extending 72 hours before, during and after floor installation.
- D. Dew Point: A minimum of 5 degree F less than the slab and air temperature during each day of work.
- E. Lighting: Provide ambient lighting at level suitable for flooring installation and evaluation.

1.12 COORDINATION

- A. Refer to Section 01300 - Administrative Requirements}; Requirements for coordination.
- B. Coordinate placement of terrazzo divider strips with location of mechanical and electrical access covers, floor mat frames, and other items built in to terrazzo.

PART 2 PRODUCTS

2.1 EPOXY TERRAZZO

- A. Acceptable Manufacturers:
 - 1. Terrazzo & Marble Supply Companies, Wheeling, IL.
 - 2. Key Resin Co, 4050 Clough Woods Dr., Batavia, OH 45103
 - 3. Master Terrazzo Technologies, 8000 Bristol Pike, Levitown, PA 19057
- B. Basic System, Design and Mix:
 - 1. Product System: Terroxy Resin Systems Epoxy Matrix by Terrazzo & Marble Supply Companies.
 - 2. Product Design and Mix : 3/8" thick epoxy resin with 80% natural aggregate and 20% glass.
 - 3. Color Blend: To be selected by Architect.
- C. Materials :
 - 1. Primer: Terroxy Primer for floor over basement, and Terroxy Moisture Vapor Primer having a maximum of 0.3 perms with 100% RH for slab on grade .
 - 2. Flexible Reinforcing Membrane: Terroxy Iso-Crack Epoxy Membrane constructed with fiberglass scrim reinforcement, for substrate crack preparation and reflective crack reduction.
 - 3. Epoxy Matrix: Terroxy Epoxy Matrix in a color to be selected.
 - a) Physical Properties without aggregates: When cured for 7 days at 75°F plus or minus 2°F and 50% plus or minus 2% RH, all specimens shall meet the following requirements:

Property	Test Method	NTMA Requirements
Hardness	ASTM D-2240 using Shore-D Durometer	60-85 psi min.
Tensile Strength	ASTM D-638	3,000 psi min.
Compressive Strength	ASTM D-Specimen B cylinder	10,000 psi min.
Flexural Strength	ASTM-D790	4,500 psi min.
Chemical Resistance	ASTM-D1308 seven days at room temperature by immersion method	No deleterious effects from: 1) Distiller Waters 2) Mineral Oil 3) Isopropanol 4) Ethanol 5) 0.025 Detergent Solution 6) 1% Soap Solution 7) 10% Sodium Hydroxide 8) 10% Hydrochloric Acid 9) 30% Sulfuric Acid 10) 5% Acetic Acid

- b) Physical Properties with aggregates: When cured for 7 days at 75°F plus or minus 2°F and 50% plus or minus 2% RH, all specimens of an Epoxy Matrix blended with three volumes of Georgia White marble blended 60% #1 chip and 40% #0 chips, ground and grouted with epoxy resin, and finished to a nominal 1/4" thick, shall meet the following requirements:

Property	Test Method	NTMA Requirements
Flammability	ASTM D-635	Self extinguishing, extent of burning 0.25 inches max.
Thermal Coefficient of Linear Expansion	ASTM D-696	25×10^{-6} inches per inch per degree to 140°F
Bond Strength	ACI COMM 403, Bulletin 59-43 (Pp 1139-1131)	300 psi min (when 100% concrete failure is incurred)
Flexural Strength	ASTM-D790	4,500 psi min.

4. Aggregates: Complying with NTMA gradation standards for mix indicated or selected and containing no deleterious or foreign matters.
- Abrasion and Impact Resistance: Less than 40% loss per ASTM C131.
 - 24-Hour Absorption Rate: Less than 0.74 percent.
 - Dust Content: Less than 1.0 % by weight.
5. Finishing Grout: Terroxy Epoxy Matrix or Terroxy Clear Resin as recommended by floor system manufacturer.

2.2 STRIP MATERIALS

- A. Divider Strips: 3/8"x1/4" L-type aluminum strips for thin set application.
- B. Control Joint Strips: Separate double L-type angles back to back with min. 1/8" width between filled with semi-flexible joint filler matching the primary floor material in composition, design and color.
- C. Construction Joint (Cold-Point) Strips: Separate double L-type angles back to back with min. 1/8" width between filled with semi-flexible joint filler matching the primary floor material in composition, design and color.
- D. Expansion-Joint Strip Strips: Separate double L-type angles back to back with min. 1/8" width between filled with semi-flexible joint filler matching the primary floor material in composition, design and color.
- E. Miscellaneous Strips: Edge-beads and other strips as required for a complete installation, Strips shall match Divider Strips in material and color.

2.3 MISCELLANEOUS ACCESSORIES AND MATERIALS

- A. Strip Adhesive: 100% solids epoxy resin adhesive as recommended by floor system manufacturer. Adhesive shall have a VOC content of 50g/L or less when calculated according to 40 CFR 59, Sub part D (EPA Method 24).
- B. Anchoring Devices: Provide mechanical anchoring devices for strip materials as required for securing attachment to substrate.
- C. Patching and Fill Material: Terroxy Fill and selected aggregate as recommended by floor system manufacturer.
- D. Joint Compound: Terroxy Joint Filler in color to be selected by Architect
- E. Cleaner: Terroxy Terra Clean, a neutral cleaner with a pH factor between 7 and 10 specifically design for terrazzo.
- F. Surface Finish System: Terrozt Natural Finish System, level of polish to be determined by Architect.
- G. Sealer: Slip and stain-resistant sealer that is chemically neutral with a pH factor between 7 and 10, a standard coefficient of friction of 0.6 or higher, complying with NTMA Specifications and Design Guide and having no effect on the physical properties of the terrazzo floor. Acceptable products include Terroxy WB Acrylic Sealer, Terroxy Acrylic Sealer, Terroxy WB Urethane sealer and Terroxy WB Penetrating Sealer.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Refer to Section 01300 - Administrative Requirements}: Coordination and project conditions.
- B. Verify that substrate surfaces conform to the project conditions included in PART 1 of this Section and are ready to receive work. Any and all unsatisfactory conditions shall be reported to Architect, and shall be corrected in accordance with correction requirements included in this Section prior to execution of work.

3.2 PREPARATION

- A. Clean substrate of foreign matter such as debris, dust, oil, grease and curing compounds and might impair terrazzo bond.

- B. Mechanically shot blast or grind with Wolverine Scarifying Diamonds to achieve surface conditions specified in PART 1. Mitigate dust from blasting and or grinding operations to prevent conditions unsuitable for floor installation.
- C. Patching and Leveling: Where required, patch voids or depressed areas in accordance with PART 1 of this section and floor system manufacturer's recommendations.
- D. Crack Repairing and Bridging: Where required, repair and bridge cracks in accordance with PART 1 of this section and floor system manufacturer's recommendations.
- E. Moisture Mitigation For Slab On Grade Areas:
 - 1. Testing: Test for moisture according to ASTM F2170, verifying that substrate has a relative humidity of less than 80% prior to execution of work.
 - 2. For slab having a relative humidity of 80% or greater, provide a moisture barrier such as Terroxy Moisture Vapor Primer as recommended by floor system manufacturer.
 - 3. Additional moisture barrier may be required per INSTALLATION instructions below.

3.3 INSTALLATION

- A. General
 - 1. Work shall comply with NTMA installation standards.
 - 2. Work shall comply with system manufacturer's instructions and recommendations.
 - 3. Stage work to ensure all in placed work are protected from installation operations and or traffics.
- B. Flexible Reinforcing Membrane for slab on grade area: As may be required, provide flexible reinforcing membrane with fiberglass scrim over slab on grade areas.
- C. Primer: Install primer in accordance with system manufacturer's instructions and recommendations.
- D. Divider, Control Joint, Expansion Joint and Construction Joint Strips: Provide types of strips as specified in PART 2 and install strips and filler in accordance with system manufacturer's instructions and recommendations.
- E. Placing Terrazzo Mixture
 - 1. Mixing: Mix epoxy matrix with chips and fillers in accordance with system manufacturer's instructions and recommendations.
 - 2. Placing: Trowel apply terrazzo mixture over epoxy primer to provide and dense flat surface to top of divider strips.
 - 3. Curing: Allow placed mixture to fully cure in accordance with system manufacturer's instructions and recommendations.
- F. Rough Grinding: Grind with 24 grit silicon carbide or D-36 diamond matrix stones until all terrazzo strips and marble chips are uniformly exposed.
- G. Grouting:
 - 1. Cleanse rough ground floor with clean water and rinse..
 - 2. Remove excess rinse water by wet vacuum and let floor dry.
 - 3. Fill voids with matching terrazzo material or clear epoxy resin.
 - 4. Allow grout to fully cure before final finishing.

H. Finishing:

1. Flood mop and wet vacuum all slurry from surface, using an agent such as Terroxy Terra Clean.
2. Grind floor progressively with 220, 400 and 600 Genesis diamond grits, and repeat step 1 cleaning application between grinding operations to remove all grit latency and particulate matters.
3. Inspect and evaluate surface finish for consistency and visible abrasive marks from grinding operations. Refinish defective areas where found.
4. Polish grinding: Use 1,000 grit Ceramica diamond pads to polish floor to a uniform reflective appearance showing no high or low sheen variances.
5. Flood mop and wet vacuum as described in step 1 to cleanse floor of particulate matters, dirt or oils.
6. Final Polish: Polish floor with an agent such as Terroxy Terra Polish applied with a white polishing pad driven by a 175 rpm floor polisher.
7. Final cleansing: Repeat step on above and thorough scrubbing. And agitating of entire floor.
8. Floor sealing: Allow the cleansed floor to complete dry and then cure for an additional four hours. Apply a sealer such as Terroxy Terra Tight Impragnator.
9. Final curing: Allow sealed floor to cur for 24 hours before use.

END OF SECTION